Metabletus americanus Dejean, 3, *Notiophilus aquaticus* Linné, 1, *Olisthopus parmatus* Say, 1, *Omophron americanum* Dejean, 3, *Patrobus longicornis* Say, 1, *Pseudamara arenaria* Leconte, 1, *Pterostichus* sp., (6), *P. adstrictus* Eschscholtz, 1, *P. coracinus* Newman, 1 (1), *P. corvinus* Dejean, 9 (1), *P. lachrymosus* Newman, 1, *P. leconteianus* Lutshnik, (2), *P. luctuosus* Dejean, 4, *P. lucublandus* Say, 27 (30), *P. melanarius* Illiger, 11, *P. mutus* Say, 10, *P. pensylvanicus* Leconte, 7 (2), *P. tristis* Dejean, 1, *Selenophorus gagatinus* Dejean, 3, *Sphaeroderus lecontei* Dejean, 1, *Stenolophus comma* Fabricius, 3, *S. conjunctus* Say, 4, *Synuchus impunctatus* Say, 11, *Tachys incurvus* Say, 1, undetermined species, 31 (17).

These data suggest that the American toad may not be entirely beneficial as a predator of noxious insects, since many Carabidae, especially larger species, are important predators of lepidopterous larvae and other destructive insects (Blatchley, 1910. The Coleoptera or Beetles known to occur in Indiana; Balduf, 1935. The Bionomics of Entomophagous Insects).

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Notes on the general biology of the flatheaded fir borer *Melanophila drummondi* Kirby reared from ponderosa pine (Coleoptera: Buprestidae). —*Melanophila drummondi* Kirby is a common metallic wood borer of dying, slow growing, freshly cut, or wind-thrown Douglas-fir, *Pseudotsuga menziesii* (Mirb.) Franco, and western hemlock, *Tsuga heterophylla* (Raf.) Sarg., in Washington state. Chamberlin (1926, The *Buprestidae of North America exclusive of Mexico*) has cited many other host species. Barr (1971, *in* Hatch, *The beetles of the Pacific Northwest*, Part V. University of Washington Press, Seattle, Washington) adds white spruce, *Picea glauca* (Moench) Voss, to Chamberlin's list of hosts for *M. drummondi*. Anderson (1966, *Forest and shade tree entomology*) mentions pine as being a host for *M. drummondi*, but does not indicate which species, nor could I find any other reference identifying pine as a host for this buprestid. I recently found *M. drummondi* to occur on ponderosa pine, *Pinus ponderosa* Laws.

Infestation of host material by *M. drummondi* occurs shortly after spring cutting or windfall and extends through early fall at low elevations. At higher elevations, infestation may be delayed by a month or more due to slower maturation of larvae and later emergence of adults. Maturation of larvae generally occurs within a year, but may take several years when live trees are attacked (Anderson, 1966).

On March 15, 1973, I placed several 1 m long bolts of ponderosa pine cut from a tree felled in the spring of 1972, 2 miles northeast of Liberty, Kittitas County, Washington, into a plywood rearing chamber maintained at 20.6°C and 78% relative humidity. The first *M. drummondi* emerged on April 22, and emergence continued until July 4, 1973, yielding a total of 12 males and 10 females. *Melanophila gentilis* LeConte, a common buprestid inhabitant of ponderosa pine, was also reared from the ponderosa pine bolts (30 ♂ ♂, 22 ♀ ♀).

The first insects noted to emerge were two individuals of the parasitoid

Hymenoptera, *Coeloides brunneri* Viereck on April 12. The emergence of bark- or wood-inhabiting insects continued through July 16, 1973. Although *C. brunneri* is primarily an ectoparasite on bark beetle larvae, it is sometimes associated with other larvae as well. Four adults of the hymenopteran *Atanycolus longifemoralis* Shenefelt emerged between May 7 and May 27. *A. longifemoralis* is a primary ectoparasite on both *M. drummondi* and *M. gentilis* (Shenefelt, 1943. Res. Stud. State Coll. Wash., 11: 51–163.).

Freshly emerged Melanophila adults were placed in cylindrical plastic containers for observation and were fed fresh ponderosa pine twigs and needles. Pine bark and wood chips were provided for the beetles to walk on. A small specimen vial cap was filled with tap water and placed in each container to supply moisture and drinking water. Nearly all individuals of both *M. drummondi* and *M. gentilis* fed on fresh ponderosa pine needles or twig phloem when needles became scarce.

In a feeding-choice experiment I found that adults of *M. drummondi*, reared from Douglas-fir, fed on needles of Douglas-fir, western hemlock, or ponderosa pine. However, closer examination of the needles of the three species revealed feeding to be greater on Douglas-fir than on the others. Although this evidence is by no means conclusive, it is conceivable that feeding preference is directly related to the host tree species in which the brood develops.—DONALD W. SCOTT, *College of Forest Resources, University of Washington, Seattle, 98195.*

Tolerance of *Neotoma* and *Rattus* to the Feeding of *Triatoma*.—Evidence is accumulating that wild rodents can tolerate feedings of large numbers of blood sucking triatomid bugs without lethal effects. These hematophagous insects normally inhabit the houses of wood rats, *Neotoma*, with associated species of white-footed mice, *Peromyscus*. Wood (1943, Am. J. Trop. Med. 23:315–320) reported survival of an adult ♀ *Neotoma a. albigula* after 14 feedings by a total of 1016 *Triatoma* during 168 days of laboratory confinement. The maximum number of bugs fed in one day was 148. Experiments reported here using a larger subspecies of *Triatoma protracta* indicate larger volumes of blood consumed in toto and for all stadia.

A wild ♀ *Neotoma fuscipes* captured 1 August 1970 in a horse barn in Juniper Hills, northern Los Angeles County, California, was transferred to the Los Angeles City College laboratory. It was fed water and rat chow with carrots, lettuce and Bermuda grass supplied at irregular intervals. Except for removal to hardware cloth cylinders for bug feedings, the wood rat was confined in a cage 28 × 21× 22 cm resting on SAN-I-CEL bedding in an open cardboard box until released alive 13 August 1971 near the original site of capture. During this time 1789 *Triatoma protracta navajoensis* (513 ♂, 644 ♀ and 612 nymphs) fed on this wood rat at 39 different times at approximately weekly intervals. The largest number of bugs fed at one time was 201 on 9 September 1970, the smallest 13 on 12 January 1971, the average was 49.5 per feeding. Adult bugs averaged 30.1 per feeding, nymphs 15.6 at any one time. The 232.5 g weight of the wood rat before first feeding on 3 August 1970 did not indicate an abnormal size but on 17 August it weighed 248.5 g and on 24 August 269 g. One young born on 30 August was found dead. Weights before and after the 36 bug feedings after birth of the young averaged 218.5 g (range 209.5 to 230) before and 214 (207–